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ORIGINAL RESEARCH

Mechanical characterisation of Tuscany masonry typologies by in situ tests

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Abstract
The paper reports the results of 105 in situ tests performed on undamaged masonry panels carried out by the authors during the last 20 years. The panels, mostly stone and brickwork masonry, were selected in 59 buildings in Tuscany (Italy) and had different texture and section typologies. The tests, aimed to evaluate both shear strength and deformability parameters, included 50 diagonal tests and 55 flat-jack tests. Main results of tests are supported by a qualitative description of the masonry textures. As a general result, a good agreement was found between the experimental shear strength and the range of values provided by the Italian Building Code. On the contrary, significant differences were obtained with respect to the longitudinal and the shear modules of elasticity. This is probably due to the high sensibility of these values to the method used to treat the data records. The results here presented, together with further data on the subject, are included in a web page named "Tuscany Masonry DataBase". The database constitutes an effective set of experimental results that can be employed to extract reference values (both quality and mechanical properties) for masonry typologies at local level.

Keywords Historic masonry · Mechanical properties · In situ tests · Diagonal test · Flat-jack test · Masonry database

1 Introduction

The Italian territory is characterized by a medium-to-high seismic hazard, with a widespread building heritage predominantly made of historic masonry buildings. The static and the seismic behaviour of these buildings has been in depth analysed by several researchers in the last decades. Nevertheless, recent earthquakes have caused extensive damages

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